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ABSTRACT

Intended to serve as an introduction to online searching in the Chicago area, the guide answers these basic questions for those considering going online for the first time: what is online searching, starting out online, local training for online searching, how to choose a terminal, 1200 baud equipment selection, how to prepare for and evaluate a search, patent searching, and how to choose database guides and thesauri. Included are a guide to the literature; the results of a survey of Chicago online users, detailing their experiences and recommendations on training, equipment, and search aids; and a directory of experienced searchers to contact locally for help. (Author/JD)

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Chicago Online Users Introductory Guide

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Sponsored by:
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CHICAGO ONLINE USERS INTRODUCTORY GUIDE
edited by Alexandra L. Moore and Sharon R. Pyrce

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INTRODUCTION

The Chicago Online Users Group (COLUG) is a forum of current and future users of online computerized search services. The group meets informally to discuss online systems. Activities include reports on the experiences and techniques of searchers, review of the fine points of online retrieval, and the exchange of information on training, services, and database content. Meetings, which are open and free of charge, are hosted by organizations in the Chicago area.

At the group's first meeting on December 10, 1976, a questionnaire was distributed to attendees to survey some of their experiences and problems encountered while searching online. The results of this survey, distributed at subsequent meetings, were found to be helpful to learn who else was searching online in the Chicago area, what databases they were using, the types of training they found helpful, the search aids they used regularly and problems encountered. In addition, those considering going online for the first time found the information valuable in getting started. Searchers generally found the results of this survey valuable even though it was not comprehensive or widely distributed.

Members of COLUG have a wide range of talents and experiences to share with each other. While there have been rigorous surveys and evaluations of searching and its growth in Illinois, there is a void in readily available information on the introductory level as well as a guide to local people with online experience who can serve as resources.

The purpose of the Chicago Online Users Introductory Guide is to serve as an introduction to online searching in the Chicago area. To those considering going online for the first time this guide will attempt to answer basic questions such as how to start out online, discussions of training, equipment, search strategy, and search aids, and identification of experienced searchers to contact locally for help. Experienced searchers will find this guide useful in contacting online users for expertise in unfamilar databases.

SPECIAL THANKS to Mary Ann Spradlin for collecting and collating the survey results, to Pat Fojtik for handling guide requests, and to Diane Allmen, David Grossman, and Penny Coppernoll-Blach for assistance in designing the survey. The editors are also grateful to the Chicago Chapter of the American Society for Information Science for its financial support and to Standard Oil Co.(Ind) for reproduction and postage of the survey.

1. STARTING OUT ONLINE

1.1 WHAT IS ONLINE SEARCHING?

by Alexandra L. Moore

Definition of Online Searching

Online systems are all around you--in banks, at airline ticket counters, at car rental agencies. Online means direct communication between a terminal and a computer through the use of telecommunications. Stored on a computer's magnetic disk are bibliographic files which a user can "search" to receive an immediate response in the form of bibliographic citations or abstracts from current journals and documents.

Benefits

Why go online when the "old way" of manual searching works? (It is still the best way to research some topics.) There are many benefits with online searching as compared to manual. Some of these benefits are listed below.

1. The primary benefit is time. Online data retrieval allows immediate access to information that would take considerably longer to obtain manually. An online search of several minutes could take hours or days with typical library aids. Turn around time to the requestor is greatly reduced. Multiple sources with current periodicals can be accessed without ever leaving your terminal.
2. Online searching is economical. Through accessing various files differ in cost and telecommunication charges, the cost of obtaining current information is reduced. Compare personnel time needed to do a manual search.
3. Online searching gives the user the flexibility to be as precise as necessary to achieve needed results. This is done through proper selection of search terms, search strategy, and choice of database accessed.
4. Online systems are democratic. The ability to retrieve information exists regardless of the size of your information center. Also many searchers may be on the system at the same time without ever knowing it.

Other benefits deserving brief mention are:

5. The ability to do retrospective literature searches.
6. The ability to increase current awareness.
7. The ability to do document verification.

Growth of Online Systems

Online retrieval systems have been in operation about 13 years. There are about 15 services internationally, 12 based in the United States. Technology for online concepts and techniques began in the late 1950s and had taken shape by the mid-1960s. In 1963, the Advanced Research Projects Agency of the U. S. Department of Defense funded two projects--one at Massachusetts Institute of Technology (MIT) and the other at System Development Corporation (SDC) on the interactive computing

and database management. The results showed that computerized utilization of bibliographic databases was feasible.

Between 1965 and 1970, several online systems were developed. These include SDC's ORBIT, Lockheed's DIALOG, and the Biomedical Communication Network of the State University of New York which has now become Bibliographic Retrieval Services (BRS). A typical service six years ago offered a user access to two or three databases. Now one service may carry between 40 and 100 databases. If a user subscribes to more than one system, approximately 300 databases are accessible. Rather than availability, selection of an appropriate database is a current problem.

Conclusion

Online data retrieval's rapid growth has made an impact on information systems, libraries, scientific laboratories, stockbroker houses, statistical services, and a growing list of others. As more information becomes available daily, the manipulation of information, that is, its generation, acquisition, and dissemination is increasingly vital. Efficiency is lost without some guiding structure to channel it in the proper direction. Online systems have been developed to help meet these needs of coping with the "information explosion."

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Cuadra, C.A., "Online Information Services Past, Present and Future", ASLIB Proceedings, Vol. 30 No. 1, January 1978.

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1.2 GETTING STARTED ONLINE
by Charlene Popek

Why Go Online?

Online searching is faster than searching manually, increasing search productivity. More searches can be done in less time with equal or better results. A manual search that takes 72 hours takes only 10 to 20 minutes online.

Online searching increases bibliographic access to abstract literature without the high costs associated with abstract subscription purchases. If you presently search subject matter in only two or three hard copy abstracts, the same subject can be searched online in six or eight or ten abstract sources. Commercial database vendors currently offer over 360 abstract sources. Many of these abstract sources, or databases, can be searched as far back as five years, and some can be searched retrospectively for fifteen years.

How to Establish Online Access

Terminal

Online searching requires a terminal, acoustic coupler, regular telephone, and a password or user identification number. The minimum investment is between $50 and $4,000 depending on whether your organization already has a terminal or must buy or rent a terminal especially for information retrieval. Portable terminals re or lease for $100 to $200 per month.

Acoustic Coupler

The acoustic coupler, or telephone receiver port, is sold as a separate piece of equipment by the terminal manufacturer. If the acoustic coupler is built into the portable-type terminals the cost of the coupler is included in the terminal cost.

Telephones

No special telephone or telephone line is required. A local telephone call puts you in contact with one of the phone network systems (Tymnet or Telenet). The network then automatically connects you to a computer containing the database.

Passwords

Passwords are user identification numbers that identify the user to the database vendor and opens access to the computer. Passwords are easily acquired by simply telephoning or writing the database vendor and requesting one or more passwords. Passwords are often used for billing purposes and provide for a measure of confidentiality.

Costs

Charges accrue only for what service is used. Therefore, the cost per search can vary greatly. Variable costs include communication charges, database

access fees, offline print charges, and training. A basic equation is:

cost ≐ terminal + communications + contact time + offline printing

(This formula does not, of course, reflect the personnel training costs.)

Charges	Cost Variations
Communications	$5 to $10 per connect hour (Group rates are available.)
Database Access Fees	$15 to $150 per hour (Average cost is between $35 and $60 depending upon which databases are most heavily used.)
Offline Prints	5¢ to 20¢ per print (Average cost is between 8¢ and 10¢.)
Training	$50 to $75 per day (Training is usually given in 1 or 2 day sessions. An initial training session and one or two annual update sessions are recommended.)

Database Vendors

Since no one database vendor supplies all of the available databases, you should consider signing up (securing a password) with more than one vendor to have access to all of the databases you will need to service your clientele. The five major commercial vendors are listed below. Some services have minimum and/or discount pricing policies which should be investigated.

Bibliographic Retrieval Services, Inc. (BRS)
1462 Erie Boulevard
Schenectady, NY 12305
518/374-5011

Lockheed Information Systems
Code 5208/201
3251 Hanover Street
Palo Alto, CA 94304
800/227-1960, 312/629-7416

Midwest Health Sciences Library Network
John Crerar Library
33 W. 33rd Street
Chicago, IL 60616
312/225-2526, x78

New York Times Information Bank
Mount Pleasant Office Park
1719-A Route 10
Parsippany, NY 07054
201/539-5850, 312/664-6536

System Development Corporation
2500 Colorado Avenue
Santa Monica, CA 90406
800/421-7229, 312/944-2797

Databases

Databases cover a wide range of subject areas in science, technology, social science, information science, business, humanities, and economics. All the present databases are regularly updated by the vendors to include the most recent information. Most databases can be searched by the author's name, subject terms or subject concepts, corporate source, journal name or by year of publication. Searching is either done from a controlled vocabulary or from the free text.

Who Should Search

Searchers can be database librarians, reference librarians, search specialists, or the user. Principal searchers should have training in the vendor's system and be familiar with the hard copy abstract or thesauri of the databases to be searched.

Whoever actually searches should use a search request form to assist orderly input and verify billing. Search request forms should include portions for user input as well as for searcher input. The user states his or her name, lists key terms to be used in the search and cites articles or author's names, if he or she is aware of any, which would be helpful for the search. The searcher then decides which databases to use, lists them, consults user guides and thesauri, formulates and records the search strategy, and then records the time, the databases actually used, and the number of offline prints requested.

2. TRAINING

2.1 LOCAL TRAINING FOR ONLINE SEARCHING
by Diane Allman

This compilation of training for online searching focuses on what is available in the Chicago area. Local training is available thru academic institutions, search system organizations, database producers who operate their own search systems, and the one local database producer.

Academic Institutions

Rosary College, Graduate School of Library Science, 7900 West Division Street, River Forest, IL 60305, 312/366-2490 or (from Chicago) 287-9374. Contact person: Richard A. Davis, Associate Professor.

Rosary's Graduate School of Library Science awards Bachelor of Arts in Library Science Science and Master of Arts in Library Science degrees. It offers a number of courses that incorporate online instruction, but no course is devoted strictly to online searching.

Course 511, Reference Sources in the Humanities, Course 512, Reference Sources in the Social Sciences, and Course 514, Reference Sources in the Sciences include coverage of the most widely used databases in each intellectual discipline and instruction in the basic DIALOG and ORBIT commands. Course 503, Cataloging and Classification includes hands-on experience with OCLC. Course 675, Health Sciences Librarianship includes discussion of MEDLARS databases.

Location, Frequency, Length, Cost: The courses are offered on the River Forest campus one or more semesters per year. Course length is one two-hour class per week for 15 weeks. Cost is $360 per course.

Restrictions: Courses are open to special students, library school students, and persons with a library science degree.

University of Chicago, Graduate Library School, 1100 East 57th Street, Chicago, IL 60637. Contact person: Julie M. Hurd, Dean of Students, 312/753-3482.

The Graduate Library School offers programs leading to the degrees of Master of Arts and Doctor of Philosophy. The School offers one course treating online searching: Course 359, Organization and Searching of Mechanized Databases.

Course Objectives: Course 359 surveys the diversity of machine stored bibliographic databases with consideration of their scope, variety, limitations, and implications for the future. File design, indexing principles, and the construction of databases are covered. Boolean logic is discussed, but strategy development and searching practice are not emphasized.

Location, Frequency, Length, Cost: The course is offered at the Graduate Library School at least one quarter per year. Course length is one three-hour session per week for 10 or 11 weeks. For tuition and fees, see the Graduate Library School Announcements.

Restrictions: In addition to matriculated students, persons may enroll in the course under the Special Summer Program, the Returning Scholar Program, or as a student-at-large. If demand for the course is high, priority is given to matriculated students.

Search System Organizations

Bibliographic Retrieval Services, Inc., Corporation Park, Building 702, Scotia, NY 12302. Local contact person: Janet Egeland, Marketing and Education Services, BRS, P.O. Box 17005, Minneapolis, MN 55417, 612/376-7244.

BRS offers users access to more than 10 million bibliographic citations in over 20 databases in the subject areas of medicine, biology, chemistry, psychology, education, agriculture, physics, engineering, computer science, and business management.

Objectives: The initial training session concentrates on the operation of the BRS software (user interface) programs and the structure of each database under these programs. The classes include a description of all BRS search commands, sign-on procedures, and general database structure.

Location, Frequency, Length, Cost: One-day beginning sessions are held monthly at regional locations. The cost is $25. On-site training, regional advanced sessions, and database specific sessions are also available.

Restrictions: Training is available to BRS subscribers only. Class size is kept small. It is suggested that trainees purchase and review the user manual before the session.

Lockheed Information Systems, 3251 Hanover Street, Palo Alto, CA 94304. Local contact person: Joseph DiSalvo, Crawford Savings Building, Suite 201, 1S 270 Summit Avenue, Oak Brook Terrace, IL 60108, 312/629-7416.

Lockheed's DIALOG service has almost 20 million bibliographic records in over 70 databases in the subject areas of technology/engineering, science, social sciences/humanities/arts, agriculture/food science, contracts/grants/current research, medicine, business/economics, and public affairs/current topics.

Objectives: Introductory seminars cover all the DIALOG features from the basic commands through SEARCH.SAVE and present additional material on search strategy and problem analysis. The seminars are restricted in size to provide each participant with a significant amount of hands-on terminal practice.

Restrictions: Through not required, it is suggested that persons review the user manual before attending an introductory seminar.

Systems Development Corporation, SDC Search Service, Santa Monica, CA 90406. Local contact person: Carol Ann A. DeKoster, 625 North Michigan Avenue, Chicago, IL 60611, 312/944-2797.

SDC's ORBIT provides access to millions of bibliographic citations in over 45 subject databases on business/management, science/technology, social sciences, and government as well as a number of multi-disciplinary databases.

Objectives: The purpose of SDC's new-user workshops is to provide individuals who have had little or no previous online experience with a basic introduction to the use of the ORBIT retrieval program. The workshops include instruction on the important features and commands on the ORBIT system, Boolean logic, search strategy development, types of databases available on the SDC system, and general principles associated with database searching. Hands-on experience is a fully integrated component of the program. Advanced-user workshops provide experienced users with a review of ORBIT features and focus on time-saver techniques, search hints, and new databases.

Location, Frequency, Length, Cost: New-user workshops are held monthly at SDC's local office. They last a day and a half and cost $65 per person ($50 for additional persons from the same organization). Advanced-user half-day sessions are held about every second month and cost $35 per person. On-site custom training packages are also available.

Database Producer-Search System Organizations

Data Resources, Inc., 29 Hartwell Avenue, Lexington, MA 02173. Local contact person: Janet L. Myers, Director of Marketing Central Region, 625 North Michigan Avenue, Suite 111, Chicago, IL 60611, 312/440-2400.

DRI's databanks contain millions of national, regional, financial, market, industry, international, and special purpose data. Other DRI services include monthly updated short-term and long-term models and forecasts, analytical software for the client to develop individual scenarios, consulting support, and quarterly outlook conferences.

Rather than online training, DRI presents educational seminars on the uses of its services. Introductory educational seminars are held monthly at its Chicago office; advanced seminars on modeling and forecasting are held several times a year.

Restrictions: Educational seminars are limited to clients under contract.

Dow Jones News/Retrieval, 22 Cortlandt Street, New York, NY 10007. Local contact person: Bob Williams, Midwest Sales Manager, 200 West Monroe Street, Chicago, IL 60606, 312/648-7666.

The News/Retrieval database is composed of up-to-the-minute news from the world wide facilities of the Dow Jones News Service, current detailed articles from the Wall Street Journal and Barrons, and current stock quotes from the 6000 NYSE, AMEX, and NASDAQ OTC companies.

Lengthy online training is not required to operate the system. According to sales manager Bob Williams, less than a half hour's instruction acquaints the new user with the basic retrieval commands.

The Information Bank, Mount Pleasant Office Park, 1719-A Route 10, Parsippany, NJ 07054. Local contact person: Barbara Mello, Marketing Representative, Suite 500, 625 North Michigan Avenue, Chicago, IL 60611, 312/664-6536.

The Information Bank contains over 1.5 million information items ("abstracts" and bibliographic citations) of economic, political, and current events of national and international interest from over 70 leading general circulation newspapers, business publications, foreign affairs journals, science publications, news weeklies, quarterlies, and monthly magazines.

Objectives: Beginning online training teaches the person with little or no background in searching to successfully retrieve relevant information from the Information Bank.

Location, Frequency, Length, Cost: One-day beginning training sessions for groups of four to five persons are generally held once a month at the office. The cost per person is $250, which includes a $100 thesaurus and two hours' search time after the session. A number of variable length training options are available for various numbers of participants at the customer's location.

A half-day advanced training session is held at the office about once every other month. The objective of advanced training is to review logic and learn short cuts. It costs $50.

Restrictions: Training is limited to Information Bank clients.

National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20014. Local contact person: Online Coordinator, Midwest Health Sciences Library Network, John Crerar Library, 35 West 33rd Street, Chicago, IL 60616, 312/225-2526, x78.

The National Library of Medicine's computerized bibliographic system, known as MEDLARS, is composed of ten databases plus backfiles containing some 3.5 million references to journal articles, books, and other materials in the health sciences published after 1965.

Objectives: Introductory training covers the history of the MEDLARS system, a description of each database, Boolean logic, a detailed study of the MEDLINE fields and file structure, and experience at the terminal. Seventy-five percent of the course is lecture; 25% is hands-on search experience. By the end of the course a person should understand the MEDLINE file, be familiar with other databases, be able to log on and conduct an elementary search, and be comfortable with search statements and commands.

Location, Frequency, Length, Cost: Introductory training is held at least once a year in Chicago or Madison, WI. The session lasts five days and costs $30-$50. A five day advances training course is offered once a year as well as an annual two day "update" session.

Restrictions: A person must be employed by a Medline Center, or by an organization applying to become one. It is expected that the person has access to a terminal and will take the 6 session self-instruction MEDLEARN course before attending an introductory training class.

NIH-EPA CIS Project, Brookhaven National Laboratory, Chemistry Department, Building 555A, Upton, Long Island, NY 11973. Contact person: Kathleen K. Taylor, 516/345-4379.

The Chemical Information System is composed of search systems on mass spectra, X-ray crystallography, carbon-13 NMR, chemical structure and nomenclature, powder diffraction analysis, Registry of Toxic Effects of Chemical Substances, modeling laboratory, and conformational analysis of molecules.

There are no regularly scheduled local training sessions.

Data Base Producer

Management Contents, Inc., Box 1054, Skokie, IL 60076. Contact person: John D. Kuranz, President, 312/967-1122.

Management Contents database may be searched through DIALOG or ORBIT. John Kuranz welcomes queries about the database and has expressed willingness to discuss the database in a variety of forums.

2.2 SURVEY OF TRAINING

The survey of training quantifies Chicago online users' attitudes and experiences towards formal training for online searching. Of the 45 respondents to the training survey, 42 had formal training. Training was recommended overall, with the exception of 10% of the respondents not recommending Lockheed Advanced training. Evaluations of the more popular search service training, from Lockheed Information Systems (LIS) and System Development Corporation (SDC), are expressed in percents. The actual number of respondnets for Bibliographic Retrieval Services (BRS), National Library of Medicine (NLM) and New York Times (NYT) training are presented instead of percents because of the small number of respondents.

Characteristics of Respondents

Training Session	Total Number Respondents	Year Taken
LIS Beginner	28	pre-76:30% 76-78:70%
LIS Advanced	21	pre-76:5% 76-78:95%
SDC Beginner	19	pre-76:34% 76-78:66%
SDC Advanced	14	pre-76:14% 76-78:86%
BRS Beginner	2	77:2
BRS Advanced	1	77:1
NLM Beginner	5	pre-76:4 76-78:1
NLM Advanced	3	76-78:3
NYT Beginner	2	76-78:2
NYT Advanced	1	77:1

Evaluation of Beginner Sessions

		LIS	SDC	BRS	NLM	NYT
Overall Quality:	Superior	3%	11%	-	-	-
	Excellent	30%	47%	-	5	-
	Good	56%	26%	1	-	1
	Fair	11%	16%	1	-	1
Could select proper database, search words, good user technique, can handle searching easily		22%	27%	-	3	-
Some confusion on database choice, search words and user technique, generally need practice		48%	40%	2	2	1
Must refer to various manuals to select database, search words and user technique, need more familiarity		30%	33%	-	-	1

Evaluation of Advanced Sessions

		LIS	SDC	BRS	NLM	NYT
Overall Quality:	Superior	5%	8%	-	1	-
	Excellent	32%	62%	-	2	-
	Good	47%	23%	-	-	1
	Fair	16%	7%	1	-	-
Methods learned help cut searching costs:	significantly	62%	62%	-	1	-
	minimally	38%	38%	1	2	-
	not at all	-	-	-	-	-

3. EQUIPMENT

3.1 CHOOSING A COMPUTER TERMINAL: DECISIONS YOU MUST MAKE
by David Grossman, The Richardson Company, Melrose Park

Assessing Individual Needs

The decision to acquire a computer terminal is generally a matter of economics. Terminals vary considerably in features and performance characteristics but, after your needs are determined, the kind of terminal you select can save additional funds both currently and in the future. Therefore, the more you know about computer terminals, the more prepared you will be to make a wise decision and the more money you will ultimately save.

The first step is to assess your individual or organizational needs. You should consider such things as:

- How much capital is available;
- How much searching you presently do;
- How many staff members are searching and how experienced they are;
- What are your plans for future growth;
- Are your needs for results immediate (online vs. offline prints);
- Will you ever be searching before a live audience;
- Will your search results need to be distributed to more than one person;
- Will you desire hard copy printouts, and if so, what kind of print quality do you need;
- Will other departments or individuals who don't do online searching use your terminal;
- Will you be leasing or buying your new terminal.

Once you have initially answered these questions, you can then proceed to explore the features or differences of current terminals on the market and try to match those features with your needs.

Terminal Features

Print vs. Display Terminals

In the computer hardware field, there are basically two output devices--those that print paper copy and those that display characters on some sort of screen. The most common of the display terminals is the Cathode Ray Tube (CRT) terminal. The advantages of the CRT are only useful if you do most of your searching offline. CRTs are generally faster than most printers and will therefore save you money because your cost online is a function of time. This cost advantage, however, is quickly lost if you begin to copy by hand data on the screen while online. CRT terminals are very good ways for group viewings. They can also be linked to other CRTs or large screens for demonstrations. At this point, CRTs are more reliable than printer terminals because they are all solid state and there are less moving parts to malfunction.

A printer terminal is a necessity if you do any online printing or need to have immediate hard copy results. Online problems can also be cleared faster and credit obtained more easily with a printer terminal.

The ultimate optimum situation would be to have a CRT and printer terminal in the same unit. This would cost a sufficient amount of money, however, and

most organizations cannot justify the expense. If you are lucky enough to afford one of these units always get a printer that will function at the same speed as the CRT so that the printer can copy online for immediate results. If you do not have this combination, the low speed printer must go into the "local" copy mode so that the CRT will transfer information to the printer in small segments so as not to exceed the buffering capacity of display. A "buffer" is a storage device used to hold characters of data for transmission from one computer component to another. Most terminals have a built-in buffering capacity but this will be easily exceeded if a CRT is displaying at a high speed and a printer terminal is functioning at a slower rate. In this case, you will have to purchase or rent a device to adjust the high speed CRT to the low speed printer. This switching process is clumsy and awkward.

If you choose a CRT for your needs, be sure that it has a large number of display lines (24 or more is adequate). The line width should be 72 to 80 characters and it should have the ability to display lower case alphabet (96 or more ASCII). The CRT should also have the ability to allow connection to an external device to interface with a hard copy printer. Other desirable options are editing features and "intelligence" (ability to be programmed).

If a printer terminal is chosen, it is often desirable to find one that prints multiple copies.

Terminal Speed

Since online costs are related to active time on the computer system, terminal speed would appear to be a crucial feature. Today, everyone is moving towards faster and faster terminals. There is some fallacy, however, in this area. The speed of a terminal is measured in "baud" or characters per second (cps). Baud is a calibration of the signaling rate equal to the total signal elements per second. These terms relate to the speed of printing or display characters and the speed of transmission. According to a study mentioned in the Radwin[1] article, however, the computer terminal is only outputting or transmitting approximately 20% of the time. The other 80% of the time involved in a typical online search is generally spent with the searcher thinking or typing (inputting). Most terminals used for online searching operate at 10, 15, 30 to 120 cps with 30 cps being currently the most popular speed. Many people are looking towards upgrading the speed of their present terminals as a possible cost effective alternative. The problem, however, with the faster terminals is that you are only saving money during the 20% of the online time that the terminal is in the transmission or output mode. The other 80% of the time, you will be saving nothing with a faster terminal which could cost considerably more to rent or purchase than the slower terminal you might now be using.

The Wish[2] article in College and Research Libraries gives a formula for figuring out costs and savings associated with terminals of various speeds. As shown in Figure 1, your online cost will decrease as the quantity of searching is increased with a faster terminal. Most organizations do enough online searching to justify the cost of a 30 cps terminal over a 10 to 15 cps terminal, but when you include the extra equipment cost of a 120 cps terminal you have to do a significant amount of searching to make it worthwhile. If you can, however, cut your search time by even a small percentage, you can assume this difference easily.

Let us take some sample numbers as shown in Figure 2. If an average search takes 15 minutes, the average database cost is $60 per hour, the average network cost is $10 per hour, and the average of 50 offline prints are produced at a

cost of 10¢ each then the total cost of a search would be $29.50 at 10 cps and $22.50 at 30 cps according to the 20% transmission and output formula. In an average search of 15 minutes, where transmission and output account for 20% of the time, a 30 cps terminal will be transmitting or outputting for three minutes while a 10 cps terminal will take nine minutes or a 120 cps terminal will require 45 seconds to do the same job. Taking this factor into account, a 120 cps terminal can do the search for only $19.88 as shown in Figure 2. The problem with the 120 cps terminal is the rental or initial purchase cost. Let us assume that a 30 cps terminal rents for $120 per month while a 120 cps terminal must be leased for $200 per month. Therefore, one would need to perform a certain minimum amount of searches per month as shown in Figure 1. In this case the 120 cps terminal saves $2.62 per search. Therefore, 30 searches or more per month would justify the 120 cps terminal. It should be mentioned, however, that many factors affect this formula for speed cost computation. In addition to the purchase or rental cost of the terminal, the speed of the terminal and the number of searches performed per month, this formula would vary with the speed of the searcher (input-output ratio), the amount of online printing required and the cost of the primary databases used.

The advantage of the 120 cps terminal is that it can do more online at a lower cost, however, if you begin substituting these citations printed at $45 to $120 per hour online for offline citations that could be produced at 10¢ per citation, your savings could quickly dwindle. Currently, there are a number of other problems associated with 120 cps terminals. In addition to the high purchase or rental cost of the actual terminal itself, acoustic couplers or modems would cost more as well and there are less models to chose from that operate at 120 cps. Currently, the networks are charging a high rate for 120 cps transmission and there is a possibility that in the future the search services themselves will charge a premium for 120 cps transmission because this speed places a much higher demand on the central processing unit than traditional 30 cps models.

Print Quality and Paper

There are two types of print used by currently existing terminals: dot matrix and solid character. Solid character print is of a higher quality than dot matrix. Dot matrix is a series of dots in a grid measured from 5 x 7 to 10 x 14. The larger the number, the closer the dots are together and therefore the better the image quality received. Any 7 x 9 or better dot matrix is of acceptable quality.

All CRT terminals use the dot matrix method of printing. Like a television set, a beam of electrons controlled by electromagnetic fields set up across the path of the beam impacts the back of the tube surface and causes the phosphor dot coated surface to emit light. The characters are produced by a pattern of these dots.

Both solid character and dot matrix printing methods are available on printer terminals. Printers are divided into two categories, impact and non-impact printing. Impact printing generally produces solid characters. The characters are transported by a device such as a chain, ball, or "daisy wheel" and strike the paper like an electric typewriter. The daisy wheel is a revolving disc with spokes extending out to the perimeter with a different character contained on each spoke. This spins around until the proper character is in position to strike the page.

Non-impact printers usually produce dot matrix characters. These character

images are imprinted on the paper by a chemical, thermal or electromagnetic means. This process often requires special paper. In the thermal method of printing, a heated stylus is used to move across specially coated paper. The stylus actually burns the image into the paper. An inkjet printer sprays charged ink on the paper in image patterns formed by electric fields, while in the electrostatic process the paper is charged directly and the image is developed by applying toner to the paper.

The advantage of non-impact printers is that they generally have fewer mechanical parts (to wear out) and operate at lower noise levels than impact printers. At this time, however, impact printers tend to have better print quality and better reliability of image produced. Paper is another consideration that tends to favor the impact printer. Many impact printers are available that produce multiple copies. In addition, the special paper required for non-impact printers can often create problems as far as costs and because of the fact that some heat sensitive papers turn grey after several months.

Other Important Considerations

Duplex - "Duplex" describes the manner in which the signal is transmitted. "Half-duplex" only allows signal transmission in one direction at a time while "full duplex" uses "echoplexing" to correct errors and allows simultaneous transmission in both directions. In "echoplexing", the terminal will print the image on the paper as the computer sees it. If you are using a network to access a search service system you need full duplex to receive the total benefits of the system. If you access a search service directly, you should use a terminal that has half duplex. Most terminals allow both options and this is the desired case. If you are using a network and only have a terminal that operates on half duplex, such as an IBM 2741, you will face the problem of having a locked keyboard, resulting in lost input and frequently aborted search commands.

Transmission and Keyboard Mode - Transmission codes refer to the number of bits in the transmission field. There are two standard codes in existance: ASCII and EBCDIC. The code used by the vendors for online searching is the ASCII code. Be sure the terminal you chose has an ASCII character keyboard and transmission code or you will have to use a chart to interpret the ASCII keyboard as well as using multiple keys to transmit.

Coupler or Modem - A modem is the device which connects the terminal to the telephone system. This can either be done acoustically or through a hard wire apparatus. Hard wire is generally more reliable than its acoustic counterpart, but one must usually sacrifice portability to achieve this additional reliability. Some terminals contain built-in couplers while others will require that you purchase or rent an additional external device. Make sure the price of the terminal includes the coupler or be prepared to spend up to several handred dollars more for the purchase or $25 more for rental of an additional coupler.

Maintenance - It is advisable to select a terminal which is relatively simple to operate and maintain. The ability of recognizing these desired characteristics becomes easier if one observes a number of different terminals.

Terminal Placement/Portability/Noise

Terminals can be divided into three size ranges: 1) portable, 2) desk top, and 3) full size. Portable terminals generally cost more to purchase or rent

than their larger counterparts but if you need portability, the cost is justified. The full size terminals require installation and cannot be moved at all. If portability is not a major consideration, you need to decide where to put your terminal. The placement of the terminal may depend on the amount of noise produced by the type of terminal that you select. Some information centers opt for sound proof rooms so as not to distrub their patrons while searching is being performed. This is also true in office situations. Some searchers prefer this arrangement to allow talking while performing searches. There is an advantage to locating the terminal in an open area in that this exposure could create a lot of publicity to increase online searching, however, one must be sure that this will not be bothering the online searcher, therefore causing extra dollars.

Lease or Purchase

The question whether to lease or purchase a terminal depends on your financial situation, the future and the volume of online searches involved. Purchasing a terminal outright is generally a lot cheaper in the long run than rental costs but many organizations opt for the increased rental costs so that with the rapidly changing technology of today they will never be stuck with an obsolete terminal. Lease option plans that allow the user to purchase the unit after some time are also a good way to acquire a terminal on a limited budget. Many of these rental or purchase plans contain maintenance and service contracts. Make sure you get a written guarantee if you pay for such an agreement.

Manufacturer or Broker

Whether you decide to purchase or lease a terminal, you can deal with the manufacturer directly or you can go through a broker. Although all the major manufacturers have offices and sales representatives in the Chicago area, there are many advantages to using a broker. Many of the large manufacturers do not like to bother with small scale purchases and prefer to give preferential treatment to their customers who purchase large quantities of computer terminals. A broker is one such customer who does purchase terminals in large quantities, receives a discount and can pass that savings onto you. Brokers also may tend to provide better service since their clientele are generally individuals who only have a limited number of terminals.

Certain terminal manufacturers, however, do not allow their products to be carried through brokers, so it is best to check both manufacturers and brokers before making a decision.

Some of the things to consider are the availability of getting replacement parts, repair service, and general reliability of the outfit you are dealing with. It is a good idea to ask your colleagues who already have terminals what they think of the equipment they have and it is not a good idea to purchase a new terminal until it has been tested and performs reliably. In the case of a new terminal it is often best to let the repairperson become familiar with the unit before you purchase it. In addition to the brokers and manufacturers, a good way to check a lot of terminals is at the computer show run by ComputerWorld magazine each May in Chicago at McCormick Place.

It is very advantageous to know your needs and the capabilities of the system in advance because most sales representatives do not know what our needs are as online searchers. Many salespersons are not familiar with the usual search service systems so it is advisable to learn as much as you can before you begin the process of choosing a terminal.

FIGURE 1

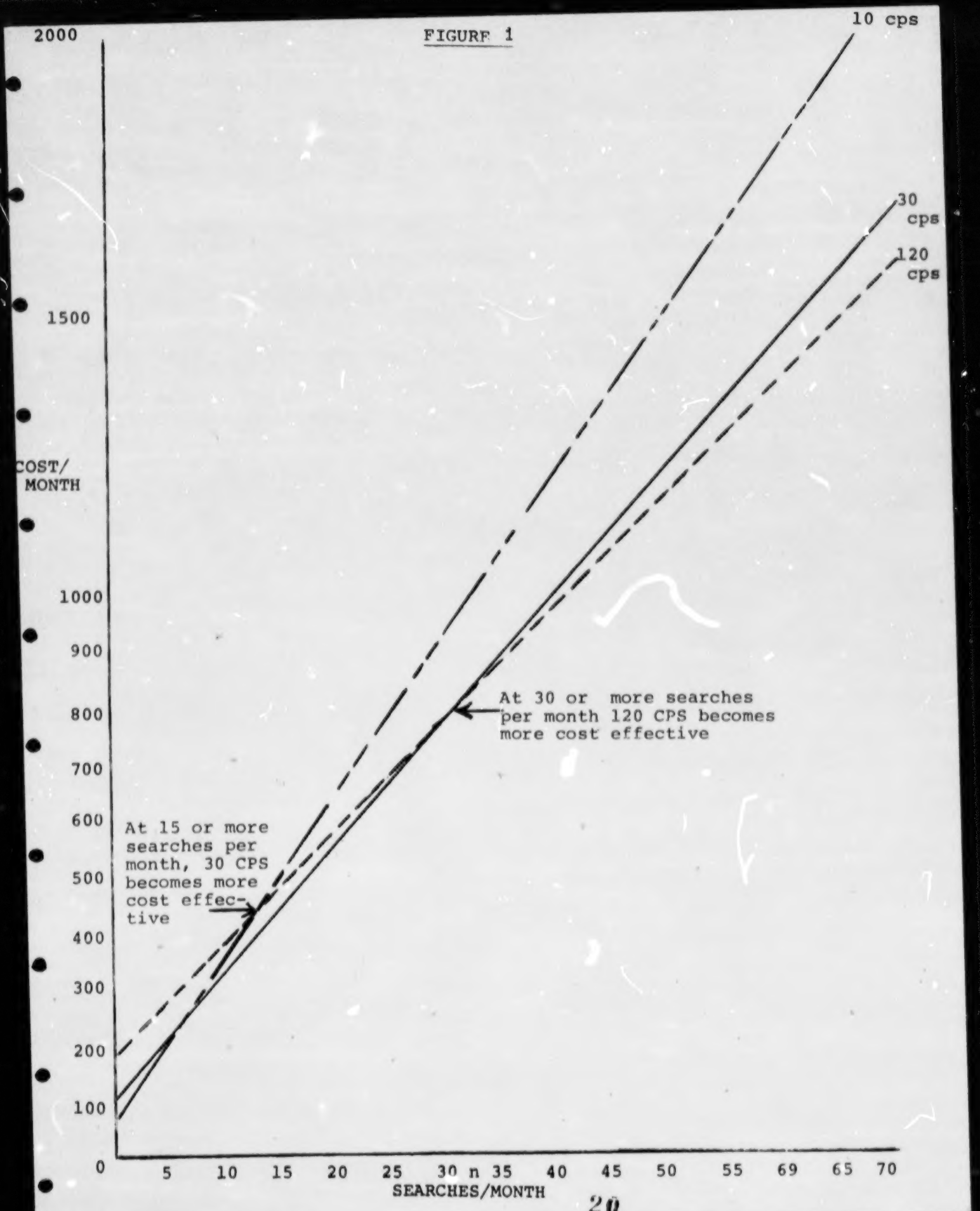
2000
1500
COST/
MONTH
1000
900
800
700
600
500
400
300
200
100
0
10 cps
30
cps
120
cps
At 30 or more searches
per month 120 CPS becomes
more cost effective
At 15 or more
searches per
month, 30 CPS
becomes more
cost effec-
tive
5
10
15
20
25
30 n 35
40
45
50
55
69
65
70
SEARCHES/MONTH

FIGURE 2

Terminal Speed and Cost Computation

1. assume fixed variables:

avg. search = 15 mins.
avg. network cost = $10/hour
avg. data base cost = $60/hour
avg. no. of offline prints/search = 50 @ 10¢ each = $5.00

2. if terminal is outputting avg. of 20% of the time on a 30CPS terminal:

@ 30CPS avg. 15 min. search = 12 mins. input + 3 mins. output

10CPS = 9 mins.
30CPS = 3 mins.
120CPS = .75 mins. (45 sec.)

speed(CPS)	search time input(min)	output(min)	total	costs network ($10/hr)	data base ($60/hr)	offline prints	total
10	12	9	21	3.50	21.00	5.00	29.50
30	12	3	15	2.50	15.00	5.00	22.50
120	12	.75	12.75	2.13	12.75	5.00	19.88

3. assume terminal rental costs:

10CPS @ $70/month
30CPS @ $120/month
120CPS @ $200/month

4. factors affecting terminal speed cost computation:
   a. # of searches performed/month
   b. speed of terminal
   c. speed of searcher (length of searches and input/output ratio)
   d. amount of online printing required
   e. cost of primary data bases used
   f. cost of terminal

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3.2 1200 BAUD SEARCHING

by Alan K. Stewart, Standard Oil Co. (Ind), Naperville

Introduction

The number of online bibliographic searches performed in information centers and libraries has increased steadily over the last few years. and this growth can be expected to continue as search services continually seek, find, and train new users. At the same time, current users are becoming more sophisticated, not only in terms of database knowledge and search system familiarity, but also in expecting a user-oriented approach to all aspects of information retrieval. The desire for higher search speeds at reasonable cost exemplifies this trend.

Telecommunications terms relevant to this discussion include:

Baud. A unit of signalling speed equal to the number of discrete conditions or signal events per second.

1200 baud is usually 1200 bits per second = 120 characters per second (cps)
300 baud is usually 300 bits per second = 30 characters per second (cps)

Full-Duplex Operation. A mode of operation in which data may be transmitted simultaneously in both directions over two channels. One of the channels is equipped for transmission in one direction while the other is equipped for transmission in the opposite direction.

Half-Duplex Operation. A mode of operation in which data may be transmitted in both directions, one way at a time.

Modem. Modulator-Demodulator. A device that modulates and demodulates signals transmitted over communications circuits. A "data set" generally refers to a modem hard-wired to a special telephone, and an "acoustical coupler" requires the phone receiver to be placed in rubber cups through which the signals are transmitted.

Incentives

Why worry about search speed when searches often retrieve years old citations that must be ordered through interlibrary loan? Because, whereas comprehensiveness and consistency are advantages of online searching, the capability for interacting with, or browsing, a file is one of the important factors differentiating online from other types of searching. Because 1200 baud access currently costs the same as 300 baud, exploring term lists and printing samples of retrieved citations are more cost-effective at this higher speed.

Please remember, however, that a fourfold increase in transmission rate does not cut search costs by a factor of four, since much terminal time is spent thinking, reading, and typing commands. With 1200 baud access, searchers encounter no barriers, psychological or economic, to a lot of online browsing. Another incentive is the ability to print final sets of references online instead of offline at comparable cost.

Equipment

Choosing among terminals is complicated enough, but selecting a 1200 baud installation can be positively masochistic. Decisions are extremely situational, and new equipment is continually becoming available; a live demonstration of contemplated equipment is a must.

Pick a modem first. Half-duplex modems, such as the Bell 202 and Anderson

Jacovson ADAC 1200, may not have the "break" capability to interrupt transmission from the host computer. Full-duplex modems currently supported are manufactured by VADIC and Bell. The VADIC 3405 is hard-wired to a special data telephone through a data access arrangement (DAA) on the wall; the 3455 is hard-wired through a system of jacks, uses an ordinary phone, and is essentially portable (see advertisement on page 83 of the June 1978 Datamation). The Bell 212A is hard-wired to a data telephone with no DAA required.

Once the modem has been selected, the next option is the terminal with printer. One of the primary factors we considered was print quality, which is especially of interest if some subsequent direct use of your online output is anticipated. Print quality is determined by how the printing is done; the two main methods are dot matrix versus fully-formed characters. Dot matrixes are usually 5 x 7 or 7 x 9, and a fully-formed character means that the whole letter is printed. Paper handling is also important, since we want to have multiple-copy capability to be able to give part of the first copy of the online print to the user and keep the second for our recrods. Noise level is also higher for 1200 baud equipment and varies among terminals. Cost is obviously a consideration, and 1200 baud equipment generally rents for about $1\frac{1}{2}$ to $2\frac{1}{2}$ times the cost of a 300 baud terminal/printer. Another factor is visibility, which includes both being able to see the line that is being typed (not exactly possible on some terminals) and also visibility to a larger area for demostrations. For this reason, we chose an inexpensive CRT that drives a receive-only (no keyboard) printer.

Intangibles

One becomes accustomed to the rhythm associated with searching at a given speed. Beginning searchers might just as well begin at 300 baud, since the amount of time spent learning at the terminal would not be substantially reduced by transmitting and printing at a faster rate. Experienced searchers, however, feel that upgrading to 1200 baud is a definite improvement they can use to advantage, and they tend to be distracted if they return to searching at 300 baud.

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3.3 SURVEY OF EQUIPMENT

The survey of equipment details the types of equipment that Chicago online users employ for online searching and their evaluation of the performance of this equipment. There were 43 respondants to the equipment survey. The following compilation indicates, for each terminal, the number of respondants who leased and purchased this equipment and the searchers who indicated a willingness to answer questions on this equipment represented by a Searcher Reference Number (assigned in the Searcher Directory which starts on page 39). Users were asked to rate the overall quality, noise level, readability, and indicate whether they would recommend this terminal. Those terminals that were not evaluated as durable or adequate, of acceptable noise level, relatively maintenance free, of good readability, and were not recommended are indicated under "comments." The modem, if any, is also indicated under the comments field.

Terminal	No. Leased	No. Purchased	Searcher Ref. No.	Comments
ADDS CONSUL 980		1	26	
ADDS ENVOY 620		1	37	readability: a few confusing characters
Bell Telephone Teleprinter Model 43	2		23,41	noise level: annoying to ears
Computer Devices Miniterm 703	1		24	
Decwriter LA36	1	1	17,27	modem: CarterFone 901A, Bell
Decwriter II LA36/LA35		1	19	modem: ComData 302A2-13
G.E. 1232 Printer	1		39	
G.E. Terminet 300	1		1,11	
G.E. Terminet 1200	2		21	noise level: annoying to ears
Hazeltine 2000	1	1	36	modem: AT&T DataPhone 1200, ComData 302A2
IBM 2741	1		17	quality: poor; noise level: annoying to ears; readibility: several confusing characters; not recommended
NCR 260		1	36	quality: poor; maintenance: occasionally down for service; not recommended
Teletype 43	2	1	3,8,12	modem: ComData 150A2
T.I. Silent 700		9	15,18, 22,26, 44	maintenance: requires some minor repairs
T.I. Silent TI33		1	6	

Terminal	No. Leased	No. Purchased	Searcher Ref. No.	Comments
T.I. 733		1	13	modem: ComData
T.I. 735		3	28,31, 33	maintenance: requires some minor repairs
T.I. 745	2	3	2,9,25	readability: a few confusing characters
T.I. Tymshare 100		1	19	not recommended--too old
Trendata 4000		1	16	noise level: annoying to ears
Western Union Video 100	2		21,37	modem: Vadic 3405

Transmission Rate Most Frequently Used

10 cps	2%
15 cps	2%
30 cps	89%
120 cps	7%

Service Contract

Have service contract	42%
Do not have service contract	58%

4. SEARCH STRATEGY

4.1 HOW TO PREPARE FOR AND EVALUATE A SEARCH

by Martha Packer, Institute of Gas Technology, Chicago

When to do an Online Search

Once you have your terminal, password, manual, and all the other assorted paraphernalia that you find necessary for searching, and you get your first search requests from patrons, you will probably find that not all your search requests are good candidates for online searching. It will be necessary for you to develop criteria for deciding whether a topic is a candidate for online or manual searching (or both). The criteria must be not only clear to you but they must also be communicable to your patrons. Monetary criteria will often play a major part in the decision, but, hopefully, who will be responsible for paying for a search will have been decided before you commit yourself to online searching.

Non-monetary criteria can be seperated into four main considerations: 1) the broadness (or specificity) of the topic, 2) the time frame from which the requestor wishes to draw references, 3) the time in which the requestor needs the information, and 4) the amount of information the requestor needs. All four of these considerations must be taken into account when making a decision. For example, a request for "a couple of articles on solar energy" does not warrant a computer search whereas a request for "any information on solar water heating in apartment buildings" does. If a requestor informs you that he is seeking information on the ABC process which was used in the 1920's and not since that time, you will undoubtedly realize that there is not much sense in performing a search on a database which only goes back as far as 1970. If a patron wants an extensive search on a very broad topic, you may decide that a computer search is valid in order to same him time, or you might start him up the manual route to see if that would help to narrow down the topic.

Refining the Search Question

Once you have found out enough about a requestor's information needs to determine that an online search will be helpful, how should you complete the reference interview in order to obtain the best search results? Some searchers prefer to have the requestor with them while they search, but often that proves impossible, and so the searcher must be sure he understands the search topic and the limits on the time of information wanted before he starts searching. Even if the requestor is with you during the search, you want to waste as little time as possible with things you should have found out beforehand while online.

Does the patron want only articles or only reports or theses or any document? Is he looking for material just in the last year or five years? Does he want a broad search which may pull in much extraneous material but is more apt to pull in all of the relevant documents or is he looking for only a few pertainent articles? Does he want only information in English or will he accept material in foreign languages, and if so, which ones?

Of course determining the above-mentioned limits is secondary to determining and narrowing down as precisely as possible the search topic itself. It helps to know something about the topic concerned in order to ask intelligent questions of the requestor, but even if you are completely unfamiliar with the topic, there are certain questions you can always ask in order to refine it for the best possible searching. Sometimes the patron will be fuzzy in his own mind about what he wants and your asking him these questions will help him to better define his topic for himself.

If a requestor wants a search on X, you can always ask, "What specifically do you want to know about X?" This will usually evoke a more specific response or sometimes you will find out that the requestor actually wants everything on a given topic. For example, if someone asked for a search on "solar energy", one could ask him in what facet of solar energy he was interested, perhaps prompting by asking whether he was interested in economics, legal aspects, new devices or technology, commercialization, etc. depending on what was known about the topic. If you are completely unfamiliar with a topic, never be embarrassed to press the requestor for an explanation; it may help if you explain to him that you can get better search results if you understand the topic better.

Once you have a topic defined, ask the requestor if he knows any synonyms for terms involved in the search. Even though you should have thesauri on hand, the more information you get from the requestor, the better. Also find out if he is already aware of any articles on the topic.

Finally, you must find out how much information the requestor believes exists on the topic. If the requestor doesn't believe you will find much and little is available, you will not be nervous about having missed something. On the other hand, if there is expected a wealth of information on a topic and you don't find anything you will be alerted to check through and perhaps revise your search strategy.

Choosing Databases

Choosing the proper databases is important for a good search. All database vendors provide lists of databases available through their services and also manuals explaining the content and format of those databases. Database suppliers normally provide further documentation such as source lists, manuals and thesauri for their products. Before you begin searching at all it is helpful to look at the lists of databases available, pick out the ones you believe you will be using the most and collect as much documentation on each as possible. Extra money you spend now will be saved as you begin searching, since you will need to spend less time online if you understand the database better. There are subject indexes to databases available such as in Computer-Readable Bibliographic Data Bases; a Directory and Data Sourcebook, compiled and edited by Martha E. Williams and Sandra H. Rouse, ASIS 1976. No subject index, however, helps as much as familiarizing yourself with a number of databases, either from the documentation about them or from scanning their printed equivalents. In choosing a database, time span of coverage, subject or discipline of coverage, and the type of materials indexed (e.g. thesis or report or article) are important considerations. The cost of one database compared with that of another may also be a consideration for you.

Choosing Terms

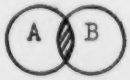
Once you have chosen one or more databases for your search, you must couch the requestor's terms and concepts in language "acceptable" to that database. Although free-text searching of titles and abstracts is available on must databases, the best search results are most often achieved by using a combination of free-text and controlled terms. Finding the controlled terms is usually done with the use of a thesaurus. (Note: some databases such as NTIS use several thesauri.) Thesauri are arranged in various ways but they normally include broader and narrower terms for a given term, related terms, and in some cases definitions or explanations for some terms. Often they include terms which are not part of the controlled vocabulary, with indication of which controlled term or combinations

of terms should be used to retrieve information on the given term. By checking the terms you have gleaned from the reference interview in the thesaurus and modifying them as indicated, you can achieve a more successful search.

Defining Logic

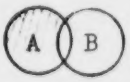
In most searching, concepts are linked using Boolean logic. The three Boolean operators are "and", "or", and "not". (In this discussion, quotation marks will be used around the words being used as operators.) These operators have precise meanings; they are not used as they are in plain Engligh.

The Boolean "and" denotes an intersection of sets; A "and" B is the intersection of sets A and B, which can be shown by a Venn Diagram as follows:



The Boolean "or" denotes the union of sets; A "or" B is the union of sets A and B, as follows:

The Boolean "not" denotes everything outside of a given set; "not" B is everything which is not included in set B. In database searching we can say A "not" B, which actually means A "and" ("not" B), to form a set of everything in A which is also not in B:



Keywords and/or free text terms or phrases are selected and combined using these operators. This selection and combination process yields your search Strategy. You may want to lay out your search strategy as shown in Figure 1. For example, if your search topic is, "What is the market for frozen yogert," you would want to include three concepts:

Concept A - yoghourt "or" yoghurt "or" yogurt
Concept B - frozen "or" freez?
Concept C - market? "or" forecast "or" trend? ? "or" future

First use Boolean "or" logic on sets formed by requesting all synonyms required to adequately cover each concept. Then use Boolean "and" logic on the resulting sets obtained from the "or" combinations.

If our search topic was, "What is the market for yogurt?", "not" logic could be used by "or-ing" yogurt terms together (Concept A) and "not" frozen (Concept B). This would eliminate all papers that deal with the market trends of frozen yogurt.

It is important to consider all possible spellings to cover all ways a specific term could be indexed. This is particularly important when searching foreign databases as in COLOR or COLOUR, FLAVOR or FLAVOUR, HEMAGLOBIN or HAEMOGLOBIN. Particularly remember British terms such as lift for elevator or napper for diaper.

Even after your search strategy has been set up, you must remain flexible enough to change your strategy while online if you are not getting the type of results that you or your requestor expect. You may have to add new terms to

Figure 1. SEARCH TITLE: What is the market for frozen yogurt?

DATABASE NUMBERS: _____

	CONCEPT A	CONCEPT B	CONCEPT C	CONCEPT D
First use Boolean "OR" logic on sets formed by SELECTing all synonyms required to adequately cover each concept	"OR" ↓ S YOGHOURT? (OR) S YOGHURT? (OR) S YOGURT	S FROZEN (OR) S FREEZ?	S MARKET? (OR) S FORECAST? (OR) S TREND? ? (OR) S FUTURE	

"AND" →

Next use Boolean "AND" logic on the resultant sets obtained from the "OR" combinations

narrow the scope of a search, broaden the search by using broader terms, or change your logic. Online searching is meant to be interactive; you can use the feedback given by the system during the search to modify the search.

Evaluating Search Output

Once you have completed a search and the results are in, how do you evaluate your search results? Without knowing exactly which citations are in a database, it is impossible to know if you have missed any citations of value to the requestor. Since degree of relevance and utility are subjective value judgements, and different patrons will be satisfied by different percentages of relevant or useful citations, it seems best to determine a requestor's overall feeling about the search. It is certainly possible to set up questionnaires asking such questions as, "How many of the citations were relevant to your topic", "Did the search miss any citations that you were already aware of?","What was your overall feeling about the search--useful, not helpful, etc.?". You may find that one person is satisfied with 100 citations of which he/she judges 10 relevant, while another will be unhappy with 15 relevant citations out of 20! Information needs are highly individualized, and two requestors receiving the same set of search results would probably judge those results differently.

Keep in mind that the main reason for evaluation is to provide feedback allowing you to improve your searching operation. Proper evaluation will give feedback not only about your prowess online and your ability to set up search strategies, but also, perhaps most importantly, about how good you are at interviewing the requestor and determining his/her needs. After all, the rationale behind online searching is to provide better information services to your patrons.

4.2 PATENT SEARCHING

by Aldona K. Valicenti, Standard Oil Co. (Ind), Naperville

Requests for patent searches have often struck fear in the hearts of many librarians and information specialists. Patents serve as legal documents and as vehicles of scientific information. It is the dual nature of patents that add special searchable characteristics.

Evaluating a Request

In evaluating a patent search request the same type of analysis should be applied as for any other search. For instance, a request for a retrospective state-of-the-art search for a specific compound preparation must be examined from several viewpoints:

1) How far back must a search be done? Some databases date back to 1950.
2) What countries should be covered? Some databases cover only the United States patents, whereas others cover world-wide patents.
3) Is is necessary to cite only those references that deal specifically with the compound preparation? A few databases offer the refinement of role specification. A substance may be searched as a reagent or product, for example.

Sources

Our major source of computerized online patent information comprises the following databases:

- Chemical Condensates, also Chemical Abstracts Subject Index Alert (CASIA) and ChemName Produced by Chemical Abstracts Service.
- CLAIMS/CHEM and GEM produced by the IFI/Plenum Data Company.
- World Patent Index produced by Derwent Publications.

These are all patent files with the exception of Chemical Condensates and CASIS which are patent containing files. There are many other patent containing files available through SDC and Lockheed that are related to specific subject areas, e.g. FSTA, Tulsa Abstracts, Titus, NTIS, Paperchem, etc. The World Patent Index and the American Petroleum Institute Patent File are private files and available only by subscription or by prearrangement with the individual producer.

Each of these databases offers some unique characteristic or scope for searching, and the information specialist must be familiar with them. Comparative evaluation typically should include the following questions:

- Is there any indexing? If there is, what are the indexing policies?
- What types of patents are included?
- What are the searchable characteristics? Can one search title words, descriptors, personal inventors, assignees or patent classifications?
- How far back does the database extend?
- Are equivalents or patent families given?
- Are priority dates included?

Certain characteristics will have greater importance to some clients than to others. Priority dates or equivalents may be of great interest to the patent staff. On the other hand, preparation of a complex organic compound may be very difficult to find if only the title words are searchable. Because patent titles frequently

are not descriptive, many database suppliers have augmented the titles to make them more informative.

Searching Shortcuts

One of the most frequently asked questions by researchers is, "I would like a listing of patents for (and state an inventor)." It is an example of the limited access that the information specialist sometimes has in looking for certain types of patent information. The only two online databases that have included personal author or inventor information in the past are Chemical Condensates and the American Petroleum Institute Patent File. Both files are selective and limited in scope in the types of patents included. Derwent publications has begun to enter inventor information in 1978. The IFI/Plenum Company also has plans to include inventor information this year with retrospective capabilities to 1971.

Another frequently asked question by the patent staff and researchers is to provide them with a listing of a particular company's patents. Company or assignee information can be accessed in all the databases but with greater ease in some files than others. In the World Patent Index (Derwent On-Line) an assignee (company or individual inventor) can be searched only by using a three or four letter code. A Patentee Dictionary is now available from Derwent Publications and it has improved the code selection process.

Questions from the patent staff sometimes come in the form of United States or International Patent Classification Codes, which can be used as very effective search tools in many of the databases. Intersection of the United States Classification codes with title words is the preferred route to searching the CLAIMS /CHEM and GEM files because they contain no other indexing parameters. The International Patent Codes (IPC) can be searched and intersected with other data elements in the World Patent Index. If the patent staff or a searcher is not familiar with the U.S. patent classification system for chemical patents, the CLAIMS/CLASS database can be used as a search tool to find the appropriate class.

Establishing equivalencies among patents that are issued in various countries has always been difficult. Many of the computerized databases include some equivalency information as part of the printed record. IFI/Plenum Company's files include equivalents, when available from Chemical Abstract, as part of the printed output. Chemical Abstracts has an online Patent Concordance which dates back to 1972, and Derwent's World Patent Index has an entire search field devoted to patent families.

All these examples and comments lead to one conclusion: there is no "one-stop" shopping for patent searches. Each of the databases offers some unique parameters, and the success rate of searching is directly related to how well the searcher understands the scope and policies of each one.

5. SEARCH AIDS

5.1 HOW TO CHOOSE DATABASE GUIDES AND THESAURI

by Penny Coppernoll-Blach, Library of the Health Sciences, University of Illinois at the Medical Center, Chicago

For the new online database search analyst, it is essential that as many database guides and thesauri as possible for each of the databases being searched are purchased. Since there are over 360 online databases worldwide presently being searched, obviously it is financially impossible to buy all search tools that are available for these databases.

Systems Manuals

The first purchases should be the system manuals for the online search services being initiated. These system manuals are indispensable for explaining how to access and interact with the system, the search commands available, how the databases are organized, programming limitations, how charges for service are calculated, and techniques for logical searching. Some manuals also give database descriptions, including the elements present in each unit record, years of coverage, numbers of citations in each file, language limitations, and so forth.

Each of the five major search services has system manuals available for purchase from the system headquarters. Bibliographic Retrieval Services, Inc. has available the BRS System Reference Manual (including database search guides) and a free periodic newsletter, "BRS Bulletin." The Information Bank from the New York Times Company has the Information Bank Users Manual, which includes the controlled volcabulary listings. Lockheed Information Systems (DIALOG) has A Brief Guide to DIALOG Searching and a two-volume Guide to DIALOG Databases, as well as a free periodic newsletter, "The Chronolog." The National Library of Medicine has the On-Line Services Reference Manual (including the database unit records) and the newsletter, "NLM Technical Bulletin." System Development Corporation (ORBIT) had available the SDC ORBIT User's Manual, numerous SDC ORBIT Data Base Manuals (each on a different database), and a free newsletter, "Search Service News."

Most system manuals are updated or revised frequently. Any searcher will find daily many problems that will be encountered while searching at the terminal that can only be answered by the system manuals. System newsletters often contain systems changes and problems, give searching hints and exercises, list training schedules, and give announcements of new databases being brought online.

Thesauri

The next purchases for the new search analyst should be all thesauri for those databases being searched that have controlled vocabularies or descriptor lists. It is virtually impossible to accurately search these files without having available the listings of controlled terms, related terms, and cross-references. An excellent example is the highly controlled MEDLINE vocabulary from National Library of Medicine, Medical Subject Headings. The search analyst must use the correct form of the descriptors and the proper hierarchical relationships between terms to insure accurate retrieval. Such thesauri often will give a history of the usage of the term, forms of the term previously used, or infrequently even numbers of postings of each term.

User Guides

Another type of searching tool is a user guide publication, which generally

includes many tools in one loose-leaf notebook. A good example of this type of tool is the ABI/INFORM User Guide, which includes a statement of purpose of the INFORM database, criteria for citation inclusion, the list of journals indexed, descriptions of each element of the unit record, sample questions, search strategy, helpful hints, the controlled vocabulary list, and a glossary of terms. Other user manuals may include items such as indexing policies, subject codes, and numerous tables. User guides are often expensive but are well worth the price if the database is searched fairly often.

A variety of search aids are also available for databases searched using free-text words. Often thesauri of terms in related fields can be used to suggest keyword phrases or to supplement free-text words. Some databases such as the NTIS database have over a dozen such related thesauri of keywords produced by the various agencies contributing to the database. Other aids published separately include lists of journals covered by a database, subject classification code lists, guides to database coverage, booklets describing helpful hints for more accurate searching in a particular database, postings lists for descriptors and/or keywords, and manuals explaining indexing policy used in creating the database. Any of these search tools can aid the searcher, particularly the new search analyst, in learning more quickly to access a database with accuracy and improved quality. The main criteria in choosing those tools to be purchased are usually availability and price. Price can vary from a free publication to search packages costing several hundred dollars, with the average price being between ten and twenty dollars.

Availability

Listings of search aids for purchase for numerous online databases are readily available from search services such as BRS, Lockheed, NLM, and SDC. These nonevaluative lists of tools for databases carried by the system are free for the asking from each headquarters, and each search tool is usually described, giving the price and address for purchase (generally these search aids must be purchased directly from the database producers). The free newsletters from the systems also include listings of new database tools. Journals such as Online are now including compilations of search aids in each issue and are a good source of information on newly available tools. Many of the database producers also publish lists of their searching aids for sale. Phone calls to other search analysts in the area searching similar databases may also bring overlooked tools to light or may furnish evaluations of tools already owned and used by that analyst.

Ownership of all the search tools and aids for the databases most frequently searched will not necessarily guarantee quality searching, but will certainly give more confidence to the searcher. Generally purchase of as many as possible of all but the most expensive tools (i.e. over fifty dollars), in combination with adequate training and online experience, should produce excellent retrieval for the search requestor.

5.2 SURVEY OF SEARCH AIDS

The survey of search aids asked online users to rate manuals and search aids as to their usefullness. While this is by no means a comprehensive compilation, it does include the major search tools and may provide guidance when deciding whether to purchase a particular one.

	helpful, precise, would recommend use and/or purchase	adequate, gave general overview	not specific enough, would not recommend use and/or purchase
ABI INFORM	1		
A Brief Guide to Dialog Searching	22	8	1
API Thesaurus	6		
Assignee List Claims	1		
Bibliographic Guide for Editors & Authors	2	2	
BIOSIS Previews Directory		1	
BIOSIS Previews Search Guide	11		
BRS System Reference Manual	3	2	
CA Condensates Search Aid Package	5	4	1
CAIN Bibliography of Agriculture	2	2	
CAIN User's Manual	4	3	
CASIA Search Aid Package	3	1	
CASIA Search Guide	2	2	
Chem. Abs. Index Guides	2		
CHEMNAME Search Guide	2	2	
Computer-Readable Bibliographic Databases: A Directory and Sourcebook	4	2	2
Concordance to INSPEC Classification	1		
COSATI Subject Categories	1	1	
DDC Retrieval and Indexing Terminology		4	
Derwent CPI/WPI User Manual	1		
Derwent Patentee Dictionary	2		
Derwent WPI On-Line User's Aid	5	2	
Derwent WPI Thesaurus	4	1	
Dissertations Search Guide		1	
EPB Thesaurus	1		
EIS User Manual	1		

	helpful, precide, would recommend use and/or purchase	adequate, gave general overview	not specific enough, would not recommend use and/or purchase
Enviromental Microthesaurus (NTIS)	1		
ERIC: What It Can Do For You		1	1
Guide to Indexing (Geological Society of America)	1		
How to Prepare a Computer Search for ERIC	2	1	1
Info Bank Thesaurus	1		
INIS Thesaurus	2	1	
INSPEC Classification	4	4	
INSPEC List of Journals	3	5	
INSPEC Thesaurus	6	1	
Integrated Energy Vocabulary (NTIS)	1		
International CODEN Directory		2	
Lockheed's Dialist	3	3	
Lockheed DIALOG Chronolog	25	6	
Lockheed DIALOG Manual Vol I	27	5	2
Lockheed DIALOG Manual Vol II	27	3	2
Lockheed's "Pick a Subject"	8	11	3
Management Contents Thesaurus	1		
Medical & Health Related Sciences Thesaurus	1		
MEDLINE MESH, Alphabetic List	11	1	
MEDLINE Permuted MESH	9	1	
MEDLINE MESH, Tree Structures	11		
NASA Recon Manual	1		
NASA Thesaurus Alphabetical Update	2	3	
NASA Thesaurus	1		
NLM On-Line Service Reference Manual	9	2	
"On-Line Commands" by B. Lawrence	3	3	
Predicasts On-Line User's Guide	15	3	
PSYCHINFO User's Guide	2	1	
Publications indexed for Engineering	5	4	
Science Citation Index	1		
SDC ORBIT Data Base Guide	9	4	

	helpful, precide, would recommend use and/or purchase	adequate, gave general overview	not specific enough, would not recommend use and/or purchase
SDC ORBIT Data Base Manuals (various)	10	6	
SDC ORBIT Search Service News	12	8	
SDC ORBIT User's Manual	14	10	
Soc. Sci. Citation Index Search Guide	1		
SSIE Hierarchial Indexes	3	2	
SSIE Microform Index		1	
Subject Coverage and Arrangement of Abstracts by Section in CA from CAS	3	1	
Subject Headings for Engineering	9	1	1
Subject and Synonym Cross-Reference List	1		
Thesaurus - Claims		1	
Thesaurus of Engineering and Scientific Terms	6	7	
The Thesaurus of ERIC Description	7	2	
Thesaurus for Exceptional Children Education	1	1	
Thesaurus of Metallurgical Terms	1		
Thesaurus of Psychological Terms	6	3	
Water Resources Thesaurus	1		1

6. DATABASE/SEARCHER DIRECTORY

Databases/Searchers

The following is a listing of databases and members of the Chicago Online Users Group who responded to the Database/Searcher Survey and indicated a willingness to answer questions on those databases they search regularly. Each searcher is represented by a Searcher Reference Number assigned in the Searcher Directory which starts on page 39.

Database	System	Searcher Reference Number
ABI/INFORM	LIS	2,5,11,18,21,27,33,36,44
	SDC	2,5,11,18,21,29,36
AGRICOLA	LIS	5,28
	SDC	5
AIM/ARM	SDC	5
AMERICA: HISTORY AND LIFE	LIS	36
APILIT	SDC	5,21,29,42
APIPAT	SDC	5,42
APTIC	LIS	44
AVLINE	NLM	19
BIOSIS	LIS	5,7,11,31,34,36
	SDC	5,31,36
	BRS	19,34
CA CONDENSATES	LIS	5,7,11,12,13,14,17,20,22,28,31,36,38,42,44
	SDC	5,11,17,36,38
	BRS	19,34
CA PATENT CONCORDANCE	LIS	5,7,12,13,14,17,42
CANCERLINE	NLM	5,11,15,19,31,44
CANCERPROJ	NLM	19
CASIA	LIS	5,11,12,13,14,17,31,34,36
	SDC	11,36
	BRS	34
CATLINE	NLM	19
CHEMICAL INDUSTRY NOTES	SDC	17
CHEMLINE	NLM	5,19,31
CHEMNAME	LIS	5,12,13,17,44
CLINPROT	NLM	19
CLAIMS	LIS	5,11,12,14,17,42
COMPENDEX	LIS	4,6,11,17,18,21,28,31,34,44
	SDC	5,11,31

Database	System	Searcher Reference Number
COMPREHENSIVE DISSERTATION ABSTRACTS	LIS	4,28,34,44
	SDC	5,34
	BRS	34
EPB	LIS	13
EIS	LIS	11,21,27,44
ENERGYLINE	LIS	11,17,21,28,44
	SDC	11,17
ENVIROLINE	LIS	17,21,36,44
	SDC	17,36
EPILEPSY	NLM	19
ERIC	LIS	20,22,31,33,36
	SDC	36
FED REGISTER	SDC	2,11,19
FSTA	SDC	42
GEOREF	SDC	21,29
INFORM	SDC	21,29,36
INSPEC	LIS	4,5,11,17,31,44
	SDC	17
ISMEC	LIS	44
HISTORICAL ABSTRACTS	LIS	36
LISA	SDC	5,17
MANAGEMENT CONTENTS	LIS	4,11,44
	SDC	5,11,21
MEDLINE	NLM	1,5,11,19,26,31,34,36
	BRS	19
METADEX	LIS	6,13,17,31,44
NASA RECON	-	13
NEW YORK TIMES	NYT	21,28,29,34,43
NSA	DOE	13
NTIS	LIS	12,19
OCEANIC	LIS	31,44
P/E NEWS	SDC	21,29
PNI	LIS	11,44
PSYCHOLOGICAL ABSTRACTS	LIS	20,22,31,36,38,44
	BRS	19
PREDICASTS	LIS	5,11,17,21,27,29,36

Database	System	Searcher Reference Number
RTECS	NLM	19
SCISEARCH	LIS	1,5,11,13,17,20,34,36,44
	SDC	1,17,36
SOCIAL SCISEARCH	LIS	5,20,22,31,34,36
SPIN	LIS	11,44
SSIE	LIS	28,44
	SDC	5,11,17,28
TITUS	SDC	5,42
TOXLINE	NLM	1,5,11,15,19,31,34
TRISNET	NLM	5,11,44
TSCA 1977 CANDIDATE LIST	SDC	5,11
TULSA	SDC	21,29,42
WORLD ALUMINUM ABSTRACTS	LIS	13,17
WORLD PATENT INDEX	SDC	5,7,11,17,21,35,42

Searcher Directory

Searcher Number	Name, Address, Telephone
1	Diane Allmen Baxter Travenol Lab, Inc. 6301 Lincoln Morton Grove, IL 60053 312/965-4700
2	C. Berger Nat'l Live Stock & Mt. Bd. 444 N. Michigan Ave. Chicago, IL 60611 312/467-5520, x33
3	Alice Bruemmer Law Library Allstate Insurance Co. Northbrook, IL 60062 312/291-5407
4	Anne Buck Bell Labs, 5A-101 Naperville, IL 60540 312/690-2551
5	R. E. Buntrock Amoco Research Center Box 400 Naperville, IL 60540 312/420-5716
6	Ida Carter Gard, Inc. 7449 N. Natchez Ave. Niles, IL 60648 312/647-9000
7	Joy-Louise Caruso Moffet Tech. Center Box 345 Argo, IL 60501 312/458-2000, x7278
8	Lera Chitwood Stuart Library, IIT 10 W. 31st Street Chicago, IL 60616 312/567-5136
9	Eunice Choi Illinois Institute for Environmental Quality 309 W. Washington St. Chicago, IL 60606 312/793-3630
10	Penny Coppernoll-Blach Univ. of Ill. at Medical Center 1750 W. Polk Chicago, IL 60602 312/996-8993
11	Shella S. Damle Borg-Warner Chemicals Wolf & Algonquin Rds. Des Plaines, IL 60018 312/827-3131, x209
12	Pat Fojtik Armak Co. Library Mc Cook, IL 60525 312/442-7100, x245
13	John Frazier Argonne National Laboratory 9700 South Cass Ave. Argonne, IL 60439 312/972-4481
14	Pamela Fritz Chemetron Corp. P.O. Box 66251 Chicago, IL 312/694-2700, x77
15	M. J. Godsel 341 E. ohio St. Chicago, IL 60611 312/670-4770
16	Rebecca A. Gonzalez 310 S. Michigan Chicago, IL 312/987-4064
17	David Grossman The Richardson Co. 2701 W. Lake Street Melrose Park, IL 60160 312/344-4300, x3361
18	Betty Hagberg Deere & Co. Moline, IL 61265 309/752-4881

Searcher Number	Name, Address, Telephone
19	Stuart J. Kolner Library of Health Sciences P.O. Box 7509 Chicago, IL 60680 312/996-8993
20	JoAnne M. Lee Lake Forest College Library Lake Forest, IL 312/234-3100, x410
21	Lynn B. Matera Standard Oil Co.(Ind) Lib/Info Center, MC2003 P.O. Box 5910-A Chicago, IL 60680 312/856-5961
22	S. V. Meschel Univ. of Chicago 5735 S. Ellis Ave. Chicago, IL 60637 312/753-8289
23	Melissa Mickey Corporate Library Kraft, Inc. Glenview, IL 60025 312/998-2465
24	Alexandra L. Moore Standard Oil Co.(Ind) 200 E. Randolph Dr. MC3802 Chicago, IL 60601 312/856-7442
25	Donna Morgan 3300 River Dr. Moline, IL 61265 309/757-5363
26	George Mozes 29th & Ellis Ave. Chicago, IL 60616 312/791-2474
27	Margaret Muller 875 N. Michigan Ave. Chicago, IL 312/664-6700, x6151
28	Martha Packer Institute of Gas Technology 3424 S. State Street Chicago, IL 60616 312/567-3869
29	Vicky A. Perlman Standard Oil Co.(Ind) Library/Info Center, MC 2003 P.O. Box 5910A Chicago, IL 60680 312/856-5961
30	Charlene Popek Beatrice Foods Co. 1526 State Street Chicago, IL 60605 312/791-8242
31	Ammiel Prochovnich The John Crerar Library 35 W. 33rd Street Chicago, IL 60616 312/225-2526, x60
32	Sharon R. Pyrce Standard Oil Co.(Ind) 200 E. Randolph Dr. MC 3802 Chicago, IL 60601 312/856-2428
33	Jennette Rader 1225 E. 60th Street Chicago, IL 60637 312/753-2024
34	Sue Robb 4901 Searle Parkway Skokie, IL 60076 312/982-8232
35	Dorothy Ryno P.O. Box 1045 Skokie, IL 60076 312/982-4607
36	Erna Schatzman VWR Library Milwaukee, WI 53201 414/963-5045

Searcher Number	Name Address, Telephone
37	Francis A. Shunk 3120 S. Princeton Chicago, IL 60616 312/225-8934
38	Mary Ann Spradlin Amoco Research Center P.O. Box 400 Naperville, IL 60540 312/420-5457
39	Alan K. Stewart Amoco Research Center P.O. Box 400 Naperville, IL 60540 312/420-5987
40	Joan Tarlov Reference Librarian Chicago College of Osteopathic Medicine 5200 S. Ellis Avenue Chicago, IL 60615
41	Mary Tyner Kraft, Inc. Kraft Court Glenview, IL 60025 312/998-2665
42	Aldona Valicenti Amoco Research Center P.O. Box 400 Naperville, IL 60540 312/420-5647
43	Carol Wilkins Chicago Public Library Chicago, IL 60611 312/269-2915
44	Gerald Yucuis IIT Research Institute 10 W. 35th Street Chicago, IL 60616 312/567-4341

7. GUIDE TO THE LITERATURE
by Veronica E. Johnson, Argonne National Laboratory, Argonne

That online literature searching has grown enormously in the past 10 years is a generalization which is scattered throughout the current literature. The literature dealing with online searching in the library has also expanded enormously. The earlier books and journal articles deal with the computer mechanics--how to program and how the computer functions. The more recent articles and books deal with the interaction between the user (librarian, information specialist, etc.) and the database via a terminal.

Guides and Directories

The first source of printed material dealing with a search service is the service itself. The commerical services such as Lockheed's DIALOG, System Development Corporation's ORBIT, and Bibliographic Retrieval Services, Inc. (BRS) all issue excellent guides to the use of their services. NASA/RECON and DOE/RECON--available to government contractors--also have guides. The New York Times Information Bank is another source of a guide to the use of its service. These services also have training sessions and publish newsletters for subscribers. (These search aids are discussed more fully in Chapter 5).

There are two directories to services and terminals which are useful in selecting services. The Directory of Online Bibliographic Services (Capital Systems Group, Inc., Rockville, MD 20852) lists and describes over 90 databases and the vendors from whom they are available. Online Directory of Terminal Sales and Service Offices, an annual published by Online, Inc., 11 Tannery Lane, Weston, CT 06883 gives information leading to terminal manufacturers' offices, leasing companies, brokers, vendors and service locations.

It may be superfluous to list Library Literature and Library and Information Science Abstracts but it is often easy to overlook the obvious. These two indexes include not only journal literature in library science but books as well.

Journals

Recent references in these indexes will lead to Online Magazine, (Online, Inc., 11 Tannery Lane, Weston, CT 06883) a journal devoted exclusively to the practical aspects of online searching. A quarterly, it began publishing in 1977. Among its recent articles are "Document Delivery" by Georgia Finnigan and Sue Rugge (Vol. 2, No. 1, Jan. 1978, p. 62-69) and "How to Promote Online Services to the People Who Count the Most..." by Janet A. Schmidt (Vol. 1, No. 1, Jan. 1977, p. 32-38). Other recent articles discuss individual databases, the role of the reference interview, and costs of online searching, in addition to the regular features which include a workshop calendar.

Another journal dealing exclusively with online searching is On-Line Review (Learned Information, Ltd, New York, NY). It also began publication in 1977. Other journals which have articles dealing with the varied aspects of online searching althcugh not exclusively limited to that topic are: Special Libraries (The Special Libraries Association, New York); Journal of Chemical Information and Computer Sciences (American Chemical Society, Washington, D.C.); Journal of the American Society for Information Science (Washington, D.C.); Journal of Library Automation, RQ, College and Research Libraries, (American Library Association, Chicago); Information Processing and Management (Pergamon Press, New York);

Library Jouranl (R. R. Bowker, New York) and Messages From MARS (a newsletter published by the Machine Assisted Reference Services division of the American Library Association, Chicago).

Monographs

For this guide only a few monographs will be discussed, the selection being a subjective one. They contain extensive bibliographies which will aid in delving further.

The Annual Review of Information Science and Technology (white Plaines, New York, published by Knowledge Industry Publications, Inc. for the American Society for Information Science) has been published annually since 1966. The purpose of the series is "to describe and appraise the publications and trends in the field of information science and technology" (1977 Annual, p. v). In the 1977 volume there are articles discussing bibliographic databases, subject analysis, and numeric databases and systems. (Numeric databases are not discussed in this guide.) There are lengthy bibliographies at the end of the articles.

Computer-Based Reference Service, by M. Lorraine Mathies and Peter G. Watson (American Library Association, Chicago, 1973) contains in Part II an excellent discussion of search strategies.

From a slightly different point of view, Pauline Atherton and Roger W. Christian's Librarians and Online Services (Knowledge Industry Publications, White Plains, New York, 1977) covers such topics as start-up considerations, marketing, service procedures, and management of online bibliographic services in the library.

An Introduction to Data Base Searching, A Self/Instructional Guide, by Edward Stockey and Sandra J. Basens (Drexel University, Graduate School of Library Science, Philadelphia, 1977) uses ERIC as its database for explaining the use of the basic commands on DIALOG after dial-up. It is specific in developing a few simple searches and in illustrating the basics of Boolean algebra as used in online searching. Use of this manual does require access to a terminal.

Through interlibrary loan, the American Library Association Headquarters Library will lend a packet of search interview forms from various universities, etc. to assist in developing one's own form or, at lease, in helping to point out the important items in a search interview (Computer Based Information Forms Collected by MARS). "Fees and Costs of Machine Assisted Reference Services", also available from the ALA on interlibrary loan, is a collection of examples of fee structures and costs from various universities, etc.

This is by necessity a brief introduction to the literature available in the field of online searching. Most of the specific books and journal articles mentioned above will lead to other pertinent literature in this rapidly growing field.

8. GLOSSARY

Boolean Operator - Those terms "and", "or", "and not" used for creating search logic in developing a search strategy. The use of these words creates subsets of records in a given database.

Character - One alphanumeric symbol, i.e. 'a', '1', '2', 'z'. Synonym for a "byte".

Citation - Bibliographic information available in variable formats in all databases.

Command - Instructions given to a computer for searching and relating functions.

CRT - (Cathode Ray Tube) An electronic vacuum tube, such as a television picture tube, that can be used to display images.

Current Awareness - A search that covers only the most recent update of a file.

Database - Files of bibliographic citations representing original printed source documents.

File - A collection of records describing the same general or specific subject. Often used interchangeably with "database".

Hit - A citation that is retrieved by entering a search term into a search system. If the search term was present in the searchable fields of the citation, then the citation is a hit.

Offline - Non-direct communication with the computer. For example, the request for offline prints will produce bibliographic citations that are printed on a high-speed printer and mailed direct rether than printing immediately at the terminal.

Online - Direct communication between a terminal and a computer through the use of telecommunications.

Postings - Citations retrieved as a result of successful search logic. Often referred to as "hits".

Search Statement - Terms entered in the proper format to be searched by the computer.

Timesharing - Computer connection via a telecommunications network such as Tymnet or Telenet.

Truncation - A method of searching in which only a word stem is searched. The truncation symbol (?, :, #) is used to denote character(s) that should be ignored by computer. Usually used as right-only truncation in which suffixes (plurals, etc.) of a word are ignored.